August 1.2 Checkpoint Technical Exchange

18 June 1997

Topics

Approve proposed changes in HLA Specifications in

- **Overview of specification update process**
  - **in general and**
  - **for the 1.2 checkpoint**
- **Review of Proposed IF Specification Updates**
- **Review of Proposed OMT Specification Updates**
- **Plans for August**

Background: Basis for HLA Evolution

- Changes/enhancements should be based on issues raised by users of HLA
- Changes need to be evaluated in terms of benefits and impacts on the HLA user community
- AMG is the focus for evolution including identifying issues, evaluating options for addressing the issues, and approving changes
- As other programs begin implementation of HLA, they will be represented in the AMG process

Background: TST Support to HLA Evolution Process

- **TST members will be designated as focal points for key areas. These members will form the core of the TST, and the TST will be the vehicle for integration across areas. Current focal points are:**
  - **Bob Lutz: OM**
  - **Reed Little: IF Spec (API)**
  - **Richard Fujimoto: TM**
  - **Katherine Morse: DDM**
  - **Judith Dahmann: Federation Management (FM)**
  - **Phil Zimmerman: Security**
- **A series of technical exchanges in key areas (TM, DDM, FM, OM) are being held regularly to develop an experience base to support HLA evolution**

Five Step Process Reviewed

- **Step 1**
  - **an AMG member expresses a need for a capability**
- **Step 2**
  - **a summary issue paper and investigation plan is developed**
- **Step 3**
  - **plan is executed and AMG monitors progress**
- **Step 4**
  - **recommended changes to HLA specification are drafted**
- **Step 5**
  - **AMG reviews recommended changes**

Regular HLA Checkpoints

- **The six month cycles discussed as part of HLA transition will serve as routine checkpoints in the HLA process**
- **One month prior to each checkpoint**
  - **progress of issue investigations will be checked**
  - **proposed changes in architecture and impact on specification will be evaluated**
  - **draft changes in specifications will be prepared for AMG review**
- **Focal points will be responsible for drafting and integrating changes across the specifications**
- **Checkpoints also provide timing for more marginal changes in specifications (e.g., text updates, deleting parameters)**
  - **Specifications have comment forms; these will be maintained by DMSO and coordinated via the TST**

Next checkpoint is August 1997

Areas Addressed for the August Checkpoint

- **Added API**
  - **JAVA API is out for review**
- **Time Management (TM)**
  - **Zero lookahead issue investigation**
  - **Coordinated with TM tech exchange**
- **Object Model Template (OMT)**
  - **Multiple Inheritance issue investigation is underway**
  - **To be addressed under OM agenda item**
  - **Coordinated with OM tech exchange**
- **Data Distribution Management (DDM)**
  - **Feedback from DDM experimentation**
    - **STOW implementation and Perceptronics experimentation**
  - **Coordinated with DDM technical exchange**

Schedule of 1.2 Specification Coordination

- **29 May**
  - **Release draft for review (includes both IF Specification and OMT Specification)**
- **4 June**
  - **specification comments due back to DMSO, using the regular specification comment process (comments are sent to hla_spec@dmso.mil, using the comment forms included with each document)**
- **5 June**
  - **technical exchange on specification updates (at IDA)**
- **11 June**
  - **final draft out for review (specifications were updated based on comments and tech exchange discussions)**
- **18 June**
  - **AMG-19 adoption of specification updates**
- **13 August**
  - **Full documentation approval at AMG-20**

IF Specification Updates

- **Declaration Management**
- **Object Management**
  - **New discovery mechanism**
- **Data Distribution Management**
- **Time Management**
- **Ownership Management**

Declaration Management

- **Separate Unsubscribe and Unpublish services**
- **Separate and rename *Control Updates* and *Control Interactions* services**
  - **changed to *Turn Updates/Interactions On/Off***
- **Interaction class inheritance mechanism changed to be consistent with the object class inheritance**
- **Documented behavior when subscribed to super-class with respect to class of object instance**
- **Documented behavior when multiple relevant subscriptions in an inheritance tree with respect to class of object instance**

Object Management

- **DM/DDM issue**
  - **New discovery mechanism**
    - ***Discover Object* has a new discovery reason supplied parameter**
  - **Attribute In/Out Scope new services**
  - **Interaction In/Out Scope**
- **Clarification of ambiguities in current specification**
  - ***Discover* and *Remove Object* now do not have Federation Time or Retraction Designator supplied parameters nor related exceptions**
  - **Attribute transport and order types revert to those defined in Fed when attribute ownership is transferred**
- **Support changes in OMT**
  - **New interaction inheritance mechanism**
- **Response to external user request**
  - **Atomic attribute reflects with respect to attribute update calls (given same transportation type and order type; and DDM constraints if appropriate)**

New Discovery

- An object instance is discovered when
  - the instance has been registered by another federate
  - the instance has not been previously discovered by this federate or has been previously removed and
  - at least one attribute of the instance is in-scope for the federate
- An attribute is in-scope for a federate when it is
  - subscribed to by the federate
  - published by another federate
  - part of a registered object instance
  - not owned by the federate
  - and meets DDM constraints if appropriate
- Object instances may be discovered for various reasons
  - instance was just registered by another federate or
  - instance was previously removed and an attribute just came into scope

Ownership Management

- **Response to issue identified in bridge federate functional definition work**
  - **Split Request Attribute Ownership Assumption and Request Attribute Ownership Release protocols**
    - **use existing services instead of returned parameters to provide the "answers"**
  - **Federate no longer must be reflecting an attribute to obtain ownership**

Data Distribution Management

- **Response to DDM experimentation**
  - **The concepts of update and subscription regions were combined for simplicity**
  - **Provide alternative services for users of DDM; all references to DDM terms removed from chapters 1-6**
    - **Register Object With Region service was added**
    - **Associate Update Region service changed to Associate Region For Updates**
    - **Unassociate Update Region service added**
    - **Subscribe and Unsubscribe Object Class Attribute With Region services added**
    - **Subscribe and Unsubscribe Interaction Class With Region services added**
    - **Send Interaction With region service added**
    - **Turn Updates On/Off for Object Instance added**
    - **Request Attribute Value Update with Region Service added**

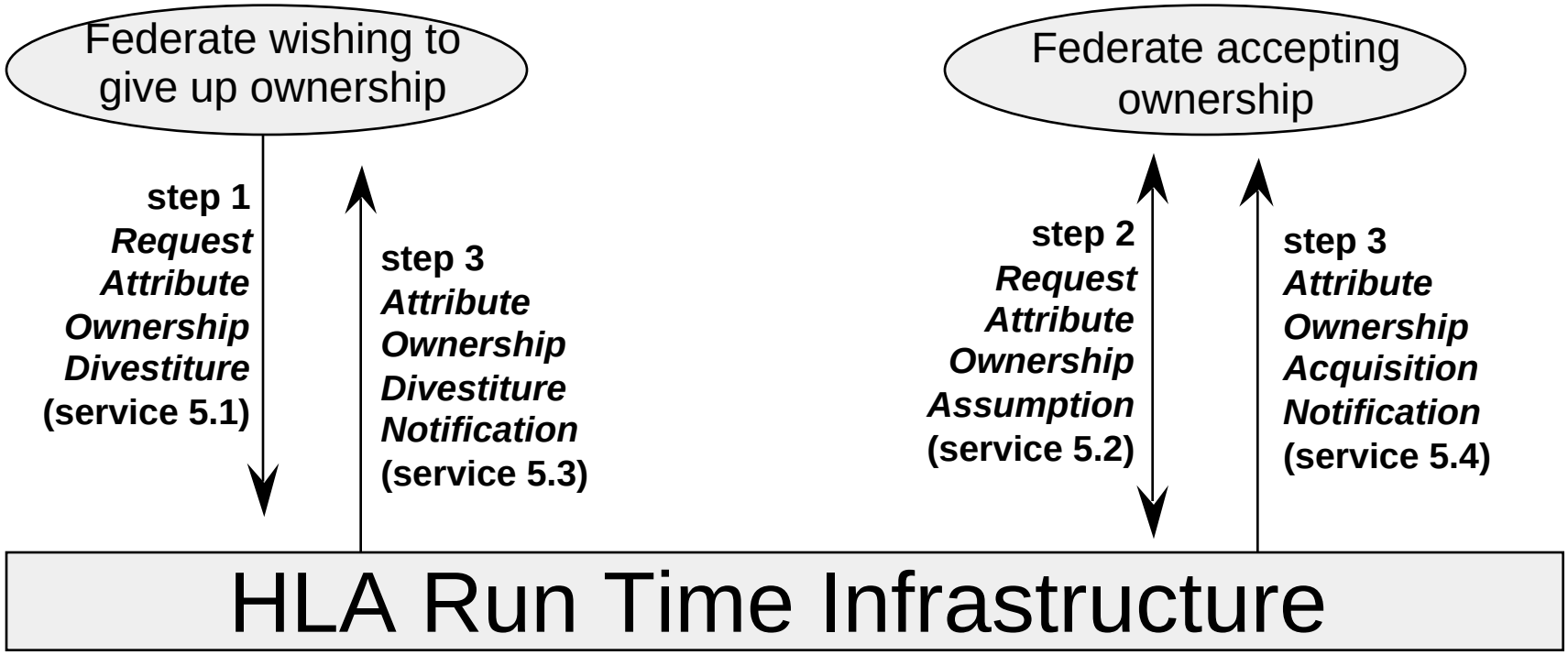
Time Management

- **Results of TM technical exchange and issue team**
  - **New time regulation services**
    - **Enable Time Regulation**
    - **Time Regulation Enabled**
    - **Disable Time Regulation**
  - **New time constrained services**
    - **Enable Time Constrained**
    - **TimeConstrained Enabled**
    - **Disable Time Constrained**
  - **New zero lookahead services**
    - **Time Advance Request Available**
    - **Next Event Request Available**

Miscellaneous

- New switch in the FED controlling the automatic issue of Provide Attribute Value Update service invocations by the RTI on object discovery
- Renamed services to be more consistent with action/function
  - Federate Save Achieved -> Federate Save Complete
  - Restore Achieved -> Restore Complete
- Miscellaneous text fixes and general cleanup
  - clarification of implied federation execution supplied parameter and federate's connection to execution
  - consistent terms (chapter -> section, desire -> request)
  - corrected several exception names
- Modify internal mechanics of document
  - automatic paragraph numbers
  - Word cross-references for figures and sections

Old Attribute Ownership Divestiture



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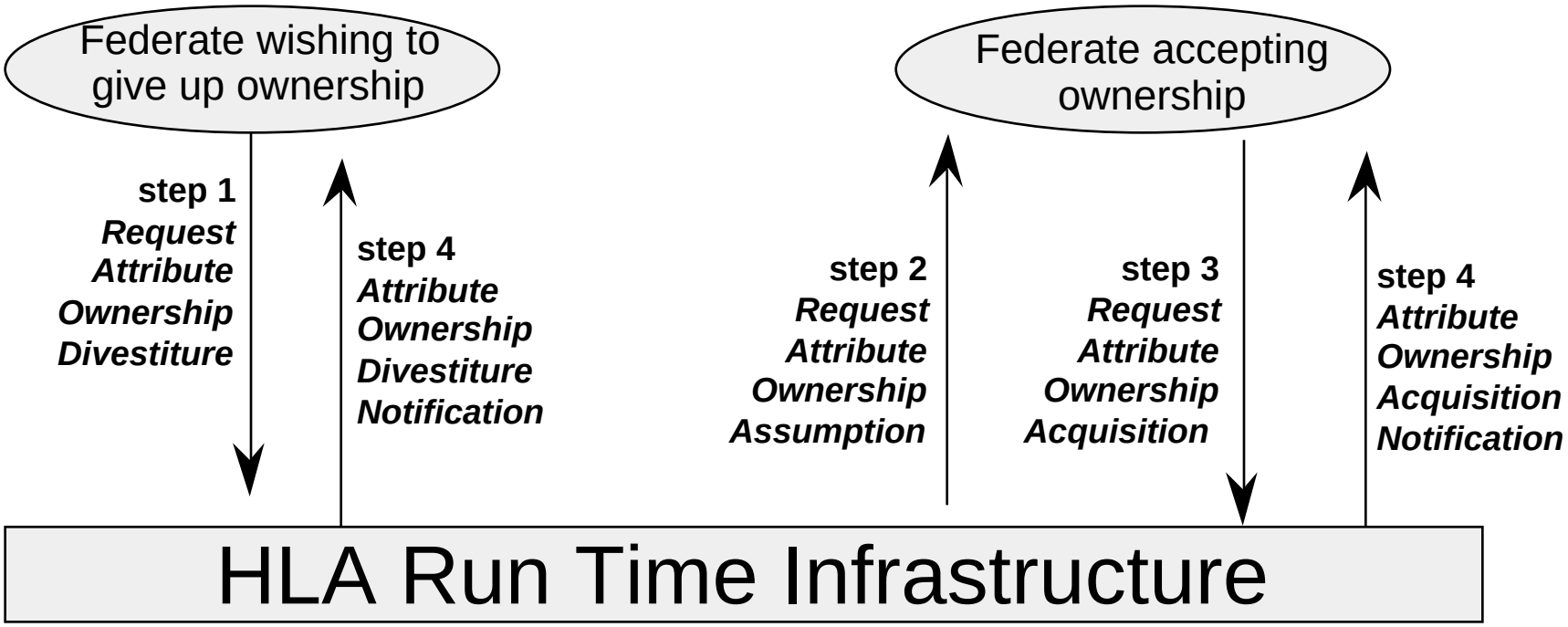
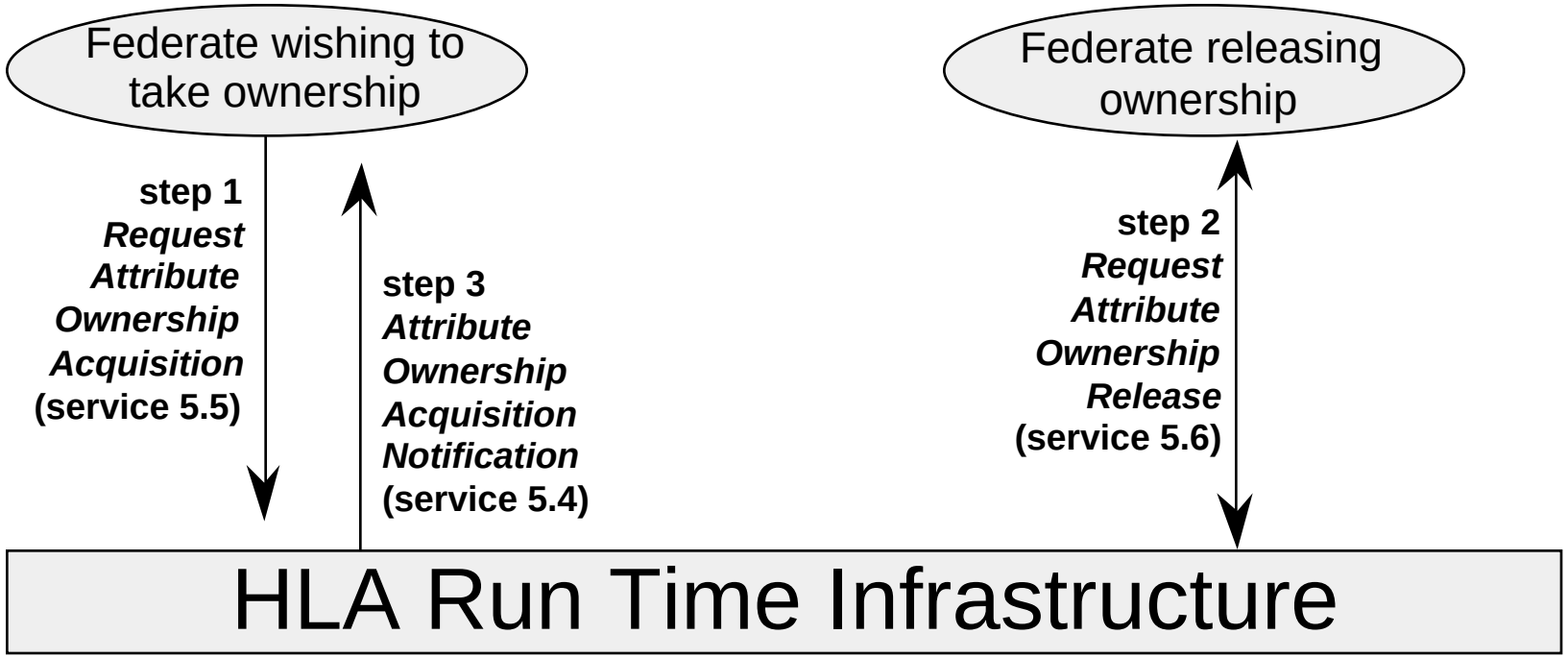


Old Attribute Ownership Acquisition



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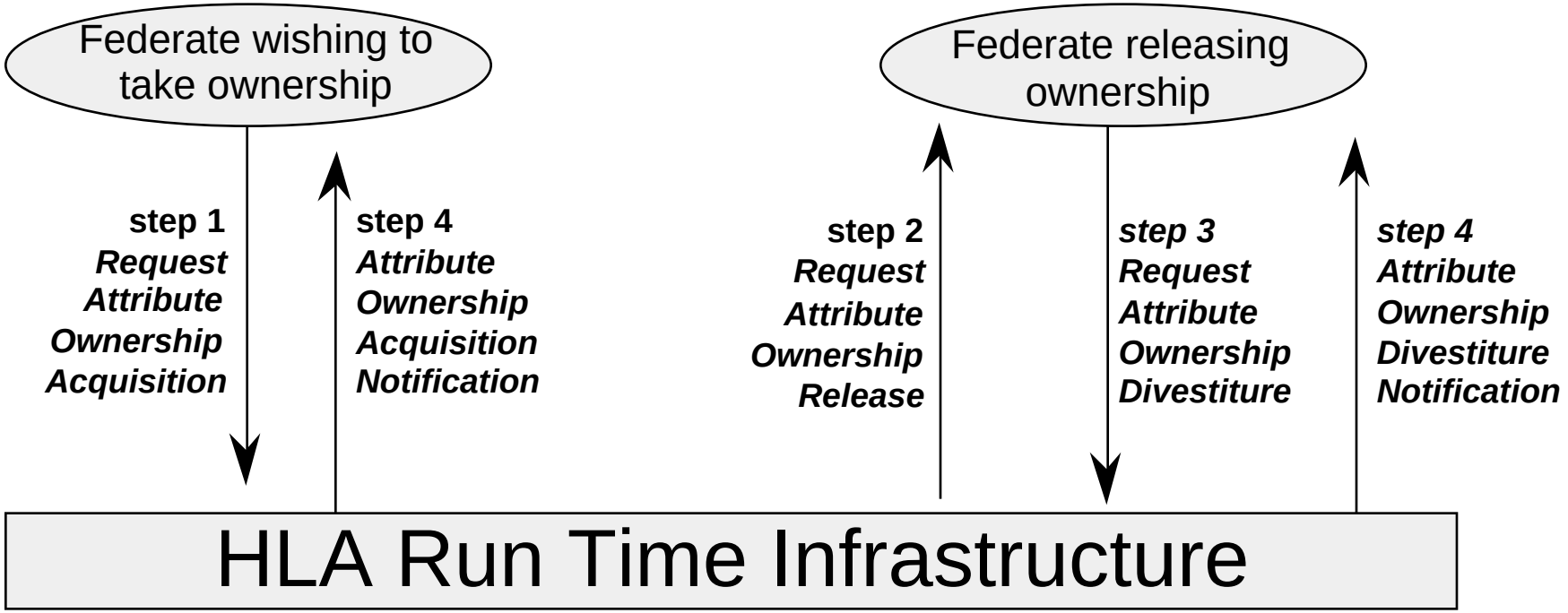

OMT Updates

- **At AMG-16, a decision was made to form an issue team to investigate the viability of supporting multiple inheritance in the OMT**
- **Observations:**
  - **No substantive need for multiple inheritance has yet been established**
  - **Single inheritance is not treated uniformly in current OMT**

Background

- **MI Issue Team recommendations**
  - **Review the OMT and recommend changes to provide consistent treatment of single inheritance**
  - **Solicit input from HLA programs as to how multiple inheritance would prove beneficial**
    - **Examples drawn from real experience**

Background

- **MI Issue Team Actions**
  - ***2 April*: Concepts for required OMT modifications discussed at OM Tech Exchange**
  - ***2 May*: Draft changes forwarded to MI Issue Team members**
  - ***7 May*: OM Tech Exchange to review proposed modifications**
  - ***28 May*: Draft mods available on DMSO home page for general review**

OMT V1.2 Mods (Summary)

- **Object Class Structure Table**
  - **No changes**
- **Object Interaction Table**
  - **Explicit class structure representation**
  - **Several information categories moved to OMT Extensions**
- **Attribute/Parameter Table**
  - **Partitioned into two separate tables**
  - **“Not Applicable” information categories removed from Parameter Table**
- **FOM/SOM Lexicon**
  - **Attribute/Parameters Definition Table partitioned into two separate tables**

Interaction Class Structure Table

Interaction Class Structure Table			
<class> (<isr>)	[<class> (<isr>)]	[<class> (<isr>)]	[<class> (<isr>)] [,<class> (<isr>)]* | [<ref>]
		[<class> (<isr>)]	[<class> (<isr>)] [,<class> (<isr>)]* | [<ref>]
		...	...
		[<class> (<isr>)]	[<class> (<isr>)] [,<class> (<isr>)]* | [<ref>]
	[<class> (<isr>)]	[<class> (<isr>)]	[<class> (<isr>)] [,<class> (<isr>)]* | [<ref>]
		...	...
		[<class> (<isr>)]	[<class> (<isr>)] [,<class> (<isr>)]* | [<ref>]
	...	...	...
<class> (<isr>)	[<class> (<isr>)]	[<class> (<isr>)]	[<class> (<isr>)] [,<class> (<isr>)]* | [<ref>]
		[<class> (<isr>)]	[<class> (<isr>)] [,<class> (<isr>)]* | [<ref>]
		...	...
...	...	...	...

Attribute Table

Attribute Table											
Object	**Attribute**	**Data-type**	**Cardi-nality**	**Units**	**Resolution**	**Accuracy**	**Accuracy Condition**	**Update Type**	**Update Condition**	**T/A**	**U/R**
<class>	<attribute>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>	<type>	<rate> | <condition>	<ta>	<ur>
	<attribute>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>	<type>	<rate> | <condition>	<ta>	<ur>
	...	...	...	...	...	...	...	...	...	...	...
<class>	<attribute>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>	<type>	<rate> | <condition>	<ta>	<ur>
	<attribute>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>	<type>	<rate> | <condition>	<ta>	<ur>
	...	...	...	...	...	...	...	...	...	...	...
<class>	<attribute>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>	<type>	<rate> | <condition>	<ta>	<ur>
...	...	...	...	...	...	...	...	...	...	...	...

T/A - Transferable/Acceptable

U/R - Updateable/Reflectable

Parameter Table

Parameter Table							
Interaction	**Parameter**	**Data-type**	**Cardi-nality**	**Units**	**Resolution**	**Accuracy**	**Accuracy Condition**
<interaction>	<parameter>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>
	<parameter>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>
	...	...	...	...	...	...	...
<interaction>	<parameter>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>
	<parameter>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>
	...	...	...	...	...	...	...
<interaction>	<parameter>	<datatype>	[<size>]	<units>	<resolution>	<accuracy>	<condition>
...	...	...	...	...	...	...	...

FOM/SOM Lexicon

Attribute Definitions		
Class	Term	Definition
<class name>	<term name>	<term definition>
<class name>	<term name>	<term definition>
...	...	...
<class name>	<term name>	<term definition>

Parameter Definitions		
Class	Term	Definition
<class name>	<term name>	<term definition>
<class name>	<term name>	<term definition>
...	...	...
<class name>	<term name>	<term definition>

Interaction Description Table

Interaction Description Table				
Interaction	**Initiating Object**		**Receiving Object/Area**	
	Class	**Affected Attributes**	**Class**	**Affected Attributes**
[<interaction>]	<class>	[<attribute>] [,<attribute>]*	[<class>]	[<attribute>] [,<attribute>]*
	[,<class>]*	[<attribute>] [,<attribute>]*	[,<class>]*	[<attribute>] [,<attribute>]*
[<interaction>]	<class>	[<attribute>] [,<attribute>]*	[<class>]	[<attribute>] [,<attribute>]*
	[,<class>]*	[<attribute>] [,<attribute>]*	[,<class>]*	[<attribute>] [,<attribute>]*
...	...	...	...	...
[<interaction>]	<class>	[<attribute>] [,<attribute>]*	[<class>]	[<attribute>] [,<attribute>]*
	[,<class>]*	[<attribute>] [,<attribute>]*	[,<class>]*	[<attribute>] [,<attribute>]*
...	...	...	...	...